

CLAIMS

1. A particle comprising vitamin B12-containing microbial biomass and a solid carrier.
2. A particle according to claim 1 wherein the weight ratio between the vitamin B12-containing microbial biomass and the solid carrier is between 0.2-5 and/or the particles
5 have been prepared by spray-drying (i.e. the particles are spray-dried).
3. A particle according to claim 1 or 2 wherein the (or average) particle size is comprised between 0.2 μm and 2000 μm , and/or particles have been prepared by co-spray drying the biomass and the solid carrier.
- 10 4. A particle according to any one of claims 1 to 3 wherein the vitamin B12-containing microbial biomass comprises a bacterial strain of the genus *Acetobacterium*, *Acetobacter*, *Agrobacterium*, *Alcaligenes*, *Arthrobacter*, *Azobacter*, *Bacillus*, *Clostridium*, *Corynebacterium*, *Escherichia*, *Eubacterium*, *Flavobacterium*,
15 *Methanobacillum*, *Methanosarcina*, *Mycobacterium*, *Propionibacterium*, *Proteus*, *Pseudomonas*, *Rhizobium*, *Rhodopseudomonas*, *Salmonella*, *Serratia*, *Streptococcus*, *Streptomyces* and/or *Xanthomonas*.
5. A particle according to any preceding claim wherein there is a core or central portion comprising the solid carrier and a coating or outer layer comprising the biomass.
6. A particle according to any preceding claim wherein the solid carrier comprises a
20 carbohydrate, a protein, or a mixture thereof.
7. A particle according to claim 6 wherein the solid carrier comprises casein, whey, milk, maltodextrin, corn steep solids, starch, edible flour, or a mixture thereof preferably as a powder.
8. A particle according to claim 7 wherein the edible flour is obtainable from wheat, rice,
25 barley, maize, oat, rye, potato, banana, or a mixture thereof.
9. A method for producing particles comprising vitamin B12-containing microbial biomass and a solid carrier, the method comprising co-spray drying the biomass and the carrier.
10. A method according to claim 9 wherein a liquid comprising the vitamin B12-containing microbial biomass and a solid carrier in powder form are used.
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11. A method according to claim 9 or 10 wherein the biomass and carrier are conveyed into a drying chamber of a spray-dryer through separate streams or ports.
12. A method according to any of claims 9 to 11 wherein a liquid suspension of biomass and the solid carrier are contacted with each other inside the spray-dryer.
- 5 13. A method according to any of claims 9 to 12 wherein the weight ratio between the vitamin B12-containing microbial biomass and the solid carrier is between 0.2 and 5.
14. A method according to any of claims 9 to 13, wherein the solid carrier has a particle size equal to or lower than 500 μm ,
15. A method according to any one of claims 9 to 14 wherein the vitamin B12-containing microbial biomass comprises, or is obtainable from a bacterial strain of the genus *Propionibacterium*.
- 10 16. A method according to any one of claims 9 to 15 wherein the solid carrier is a carbohydrate, a protein, or a mixture thereof.
17. A method according to any one of claims 9 to 16 wherein the solid carrier comprises edible flour.
- 15 18. A method according to any of claims 9 to 17 wherein the liquid comprising the biomass has been subjected to concentration or evaporation, pasteurisation and/or diafiltration prior to spray drying and/or the liquid is atomised inside the spray dryer.
19. A method of any one of claims 10 to 18 wherein the concentration of vitamin B12-containing microbial biomass in the liquid suspension is between 50 and 300 g/l.
- 20 20. A particle comprising vitamin B12-containing microbial biomass and a solid carrier obtainable by a method according to any one of claims 9 to 19.
21. A composition comprising particles according to any one of claims 1 to 8 or 20 or particles preparable by a method according to any of claims 9 to 19.
- 25 22. An animal feed comprising particles according to any one of claims 1 to 8 or 20.
23. A composition edible by humans comprising particles according to any one of claims 1 to 8 or 20.
24. A composition according to claim 23, which is a human food or food supplement, foodstuff, nutritional or dietary supplement or a pharmaceutical composition.